



IMPORTANCE OF TEACHING IN ENHANCING THE QUALITY OF ENGINEERING EDUCATION

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ABSTRACT

The economic success of any country is directly determined by the quality of Higher Education system prevailing. A developed nation is inevitably an educated nation. Indian higher education system is the third largest in the world, next to the United States and China. The sector, in recent decades, has witnessed a tremendous growth in many aspects such as the institutional capacity, student enrolment, teaching – learning process, teacher-student ratio, etc. The rapid expansion of the Engineering education system, at the same time, has brought several pertinent issues related to equity, efficiency, excellence and access to higher education in the country. The key factors that influence the quality of higher education is the quality of faculty, curriculum, infrastructure available, research environment, accreditation, administrative policies, funding, methods of evaluation and good governance. For study purposes 25 Engineering Colleges from within the states of Maharashtra, Karnataka, Tamilnadu, Telengana and Kerala were taken and their faculty members were considered as the population. Twelve teachers from each institute were taken as the sample of the study. The survey was accomplished through students as they were considered tougher evaluators of the teachers so the selection of the good teachers was completed on the basis of the five common competencies such subject knowledge and subject area teaching, teaching and learning, research work and professional behaviour /ethics.

KEYWORDS: Education, Learning Teaching.

INTRODUCTION:

Engineering education in India has experienced commendable expansion post independence. India has produced scientists, engineers, technologists, doctors, teachers and managers who are gaining top demand all over the world. Now India is one among the top ten destinations, in our industrial and technological capacity, because of the significant contribution of manpower and tools provided by the Engineering education. The quality of education is assessed through the quality of curriculum, students, teachers, teaching methodology, good governance, funding, methods of evaluation and linkage with other apex institutions. The most important out of these factors is the quality of Faculty members and quality in teaching and Learning. According to the Barnett (1994) higher education as the production of qualified manpower; higher education as training for a research career; higher education as the efficient management of teaching provisions; higher education as a matter of extending life chances. Quality in higher education is multidimensional concept, which should embrace all its functions, activities, teaching and academic programmes, research and scholarship, staffing, students, building, facilities, equipment, services to the community and the academic environment UNESCO. (1998). Quality of Higher Education is directly related to the quality of teachers. The teacher is at the heart of the educational process. It is extremely important that he/she should be professionally competent and dedicated to his/her profession so that the overall system could be uplifted. A university teacher is more than a teacher of his/her subjects, he/she should be a powerful influence for enlightenment, stability, good conduct and national cohesion. Mc Carty, (2003). In higher education, university teachers play an effective role to understand and to improve the teaching & learning process Zaman, (1998). Teaching means to help somebody to learn something by giving information of it. Imparting instructions or guiding the students in institutions is called “teaching”. In wider perspective it implies the interaction between the teachers and the taught, preparation and planning of the lesson, collecting necessary “teaching aids” and also such activities as evaluation of the instruction and communication Misra, (2002). The overall development of higher education will take place when teachers participation with vision to make education system more knowledgeable and upgraded. The support and sum of value in education system is an hour to make all probable attempts to be value-oriented education Sarita B. Mantri (2015). Even though these challenges exist, higher education system of India possesses a lot of opportunities to overcome these and have the capability to make its identity at international level.

OBJECTIVES OF THE STUDY:

In the light of the discussions and the available literature relating to Engineering education in India, the following specific objectives are framed to present this macro level study.

- To analyze the present status of Engineering education in India
- To highlight the opportunities and challenges faced by the Engineering education sector.
- To examine the Role of Teaching Learning in the prevailing system

- To evaluate indicators of good teaching
- To suggest measures to strengthen the role of teachers and effective teaching

GROWTH OF ENGINEERING INSTITUTIONS:

Initially, Engineering education was based on the British model and emphasized the importance of engineering professional practice. After independence it has been constantly influenced by American education system in its contents. The 20th century witnessed tremendous progress and incredible developments took place in the field of engineering education. Technical education system is to produce trained manpower in adequate number for the economic and technological development of the country. It plays an important role for the economic and industrial growth, national developments and international competitiveness.

The beginning of formal technical education in India can be dated back to the mid 19th century. The major policy initiatives in the pre- independence period includes appointment of the Indian Universities commission in 1902, issue the Indian Education policy resolution in 1904 and Governor General's policy statement of 1913 stressing the importance of technical education. The establishment of IISc., Bangalore, Institute of Sugar, Textile and Leather Technology in Kanpur, NCE in Bengal in 1905 and industrial schools in several provinces and significant development includes:

- Constitution of technical education committee of the central advisory board of Education(CABA) in 1943
- Preparation of sergeant report of 1944
- Formation of All India council for Technical education (AICTE) in 1945 by the Government of India.

All India Council for Technical Education (AICTE), a statutory body under Ministry of HRD, Govt. of India, approves and regulates the institutions falling under the category of Technical Education viz a viz those offering UG/PG and Diploma level courses in Engineering/technology, Pharmacy, Architecture, hotel management & catering technology, management studies, computer applications and applied arts & crafts. The scenario of Engineering Education sector during the last 5 years is depicted in the table 1.

At the time of independence, the size of Engineering education in India was small and catered only to the elite brains. The tremendous expansion that we witnessed has democratized the system. Now, about 60 % of the enrolments in Engineering Education is from the lower-middle Socio- economic strata. During, the late 80's, the growing demand for Engineering education exercised ample pressure on the Government to change its policy and allow the entry of Private enterprises to this sector thereby increasing the competition, both quality and quantity wise. But the enormous growth in quantity was indirectly posing to the deterioration in quality. The race to achieve the quantity started dilution in the overall system. The institutes and the total intake offered state wise is shown in the table 2.

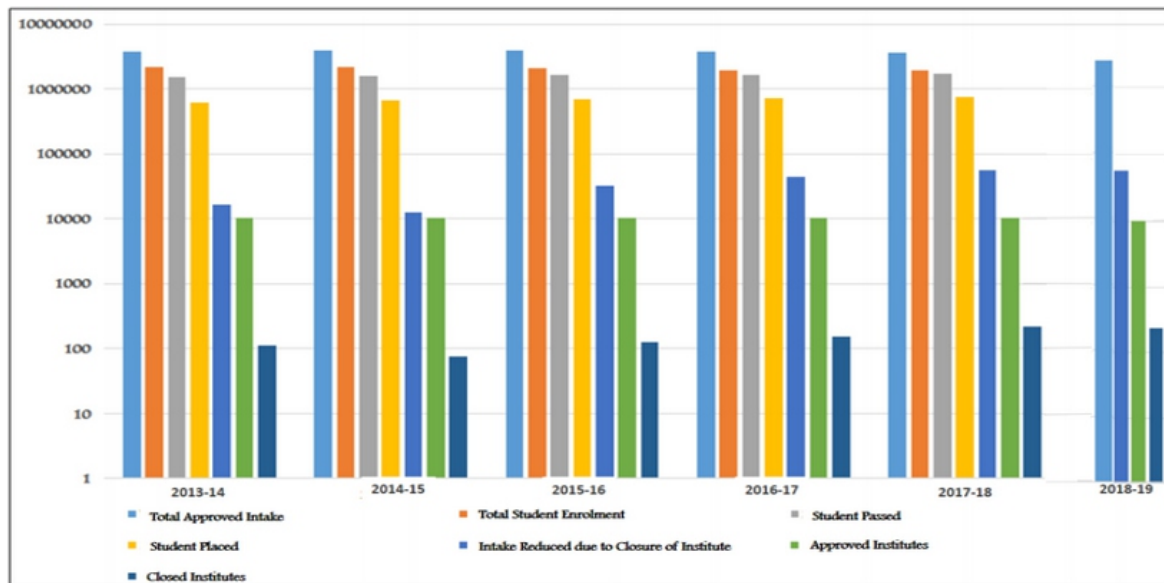


Table 1: Scenario of Engineering Education in India

Region	State	Institutions			Approved Intake			Institutions	Approved Intake
		Diploma	PG	UG	Diploma	PG	UG		
Central	Chhattisgarh	85	44	62	13460	4475	20314	127	38249
	Gujarat	147	224	200	68765	25962	67741	418	162468
	Madhya Pradesh	234	363	292	41391	46671	87238	575	175300
Central Total		466	631	554	123616	77108	175293	1120	376017
Eastern	Andaman and Nicobar Islands	2	0	1	480	0	90	2	570
	Arunachal Pradesh	8	2	1	1040	198	360	10	1598
	Assam	28	22	24	4393	1812	3503	59	11712
	Jharkhand	57	17	20	15177	3083	6681	82	24941
	Manipur	3	1	1	370	40	150	4	560
	Meghalaya	3	2	2	380	150	660	7	1190
	Mizoram	3	3	1	240	122	30	4	392
	Nagaland	9	2	2	585	120	540	13	1245
	Odisha	158	130	111	46321	15039	41983	300	103365
	Sikkim	3	2	4	570	234	800	7	1604
	Tripura	7	3	3	1150	180	623	13	1953
	West Bengal	165	104	111	40170	10474	38598	286	89242
Eastern Total		446	288	281	110878	31472	96022	787	238372
North-West	Chandigarh	5	10	7	960	1065	1821	15	3846
	Delhi	20	52	24	5750	13034	9893	78	28677
	Haryana	203	185	188	50141	21039	46978	402	118158
	Himachal Pradesh	34	21	33	6870	1481	6333	66	14684
	Jammu and Kashmir	30	19	12	5685	1600	3975	54	11260
	Punjab	221	168	147	56935	16424	39262	393	112621
	Rajasthan	205	135	154	41335	13342	48563	371	103240
North-West Total		718	590	565	167676	67985	156825	1379	392486
Northern	Bihar	69	38	42	17855	3147	11290	134	32292
	Uttar Pradesh	753	539	418	152100	70374	118844	1261	341518
	Uttarakhand	136	67	48	20143	6380	11795	194	38318
Northern Total		958	644	508	190098	80101	141929	1589	412128
South-Central	Andhra Pradesh	317	581	418	79676	88499	167171	790	335346
	Telangana	203	545	363	52429	86801	130548	669	269778
South-Central Total		520	1126	781	132105	175300	297719	1459	605124
South-West	Karnataka	349	363	277	95808	49206	110318	751	255332
	Kerala	87	218	276	23615	20534	60195	384	104344
South-West Total		436	581	493	119423	69740	170513	1135	359676
Southern	Puducherry	9	13	19	2422	1688	8010	29	12120
	Tamil Nadu	501	704	593	198784	86212	304138	1334	589134
Southern Total		510	717	612	201206	87900	312148	1363	601254
Western	Dadra and Nagar Haveli	1	2	1	390	90	60	3	540
	Daman and Diu	2	0	1	540	0	180	3	720
	Goa	9	5	8	2935	675	1490	17	5100
	Maharashtra	741	688	622	153556	81410	164102	1555	399068
Western Total		753	695	632	157421	82175	165832	1578	405428
Grand Total		4807	5272	4426	1202423	671781	1516281	10410	3390485

Table 2: Statewise distribution of Engineering Institutions

RESEARCH METHODOLOGY:

Research demands identification and study of problems in a systematic manner to arrive at a meaningful solution. The main purpose of this study was to analyze the quality of teaching and its contribution enhancing quality in Engineering education. The nature of study was descriptive/survey. Hence it was delimited to only federal university teachers. Total population of study consists of Engineering Colleges from 5 states. From this population 300 teachers (12 from each institution) were selected as sample. The nature of sample was purposive as only permanent faculty members from these institutions were selected with the help of student's feedback. For this purpose 5 students from these institutions were selected for data collection. They were oriented in the selection criteria for good teachers. The competencies that were considered for the analysis were:

- Knowledge on Subject
- Teaching and learning process
- Research
- Evaluation techniques
- Behavior and Professional Ethics

For data collection, two research instruments were used. One unstructured questionnaire based on five major common teaching competencies was used for the selection of good teachers. Another questionnaire on three point scale was used for data collection from faculty members within selected sample. For pilot testing, questionnaire was distributed among experts who improved and modified the questionnaire in respect of type of institute, format and meaningfulness. Numbers of items were curtailed from 40 to 25.

Sl No	Particulars	Absolutely	Seldom	Never	Mean Score
1	Infrastructure and teaching aids needed for effective teaching are available	20	70	10	1.98
2	College authorities motivates the Faculty members to remain integrated	6	6	88	1.18
3	Excellent teachers are rewarded	2	4	94	1.08
4	Teacher try project themselves as Role Models	20	16	64	1.46
5	Hassle free academic environment is available within the campus	18	22	64	1.32
6	Workshops/ Seminars, Industrial Visits and Invited guest lectures are arranged frequently to update the Knowledge of teachers.	10	18	72	1.2
7	Evaluation of faculty members are done unbiased	2	6	92	1.1
8	Methods adopted for teaching are satisfactory and effective	8	80	12	1.92
9	College management shows keen interest in the effectiveness of teaching	22	70	8	2.14
10	Institution provides adequate infrastructure which helps teaching and learning issues	4	16	82	1.26
11	Achievements of teachers are rendered appreciation by the management through awards etc	2	12	86	1.16
12	Policies prevailing in the institution include the fostering of good teaching	-	6	94	1.06
13	Ability to teach is treated as the major criteria for selection of teachers.	2	12	86	1.16
14	Faculty members who are not good in teaching also gets promoted to higher grades	12	75	13	1.99
15	Research by teachers receive more appreciation than ability to teach well.	-	3	97	1.03
16	Head of Department take the full responsibility of teaching and learning within the department	14	67	19	1.95

17	Teachers update their knowledge time bound	22	76	2	2.12
18	Faculty members are encouraged to attend Seminars and faculty development programmes outside the Country and State	2	9	89	1.13
19	Teachers are aware of the Performance appraisal system.	4	9	87	1.17
20	Teaching improvement grants are constituted by the institution to improve the effectiveness of faculty members	.	3	97	1.03
21	Professional and career development opportunities are equally available for all faculty members within the institution	-	2	98	1.02
22	A ranking mechanism shall be executed amongst good teachers within the department	97	2	1	2.96
23	Excellent teachers must be encouraged through public announcement	95	4	1	2.94
24	Institution must take the initiative for linkage/collaboration with international organizations for enhancing the quality teaching	99	1		2.99
25	Heads/Dean should provide updates on recent developments in teaching , research opportunities and industrial tie ups.	99	1	-	2.99

Table 3: Analysis of Questionnaire

DISCUSSION:

Table 3 deal with the opinion of university teachers about the quality of teaching and quality of education. The items of the table focus the indicators mainly value of teaching, contribution of quality teaching and efforts made by institutions for promoting quality teaching. From the analysis, it is observed that free and conducive environment is not available in the campuses and points finger on whether the process of teaching and learning is imbibed at a true sense. It is also a matter of great concern to note that the Universities/ Management of institutions are not paying commendable attention towards the quality of teaching and there is no quality check mechanism to assess whether the teachers are updating their technical knowledge regularly. Investments made on teaching aids are also mere. Also it is revealed that there is no mechanism available as on date to develop the integrity amongst faculty members and the evaluation criteria deployed too is not giving the correct picture. Managements seldom encourages good teachers by allowing them grants for procuring state of the art teaching aids or in attending faculty development programmes organized by various technical organizations including the regulators. The newsletters issued by the Universities/institutions are not covering any text on effective teaching. The most shocking fact to the researchers were that Good teaching is not given any weightage while the selection of faculty members. Here his/her research aptitude is weighed more than the teaching skills.

Linkages with national and international institutions should be encouraged equal chances of access to latest academic developments should be provided to all teachers.

CONCLUSION:

The researcher concludes that, professional skills, communication, course and methodology, research abilities, curriculum design and improvement, environment awareness, promotion of social values and leadership are the teachers input for preparation and sustaining the quality of education. These components of quality enhancement might be different from institution to institution, that's by while exchanging the experience among institutions might give new ideas and knowledge which help in include in norms and strategies of quality assurance management processer. Thus the above component helps in upgrading the quality of Indian higher education.

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